

18,862

THE
Academy of Natural Sciences

OF

PHILADELPHIA

ANNUAL REPORTS

1915

Annual Reports

1915

REPORT OF THE RECORDING SECRETARY.

Six meetings were held during the year, with an average attendance of fifty-eight. Communications of interest, as recorded in the PROCEEDINGS, were made at the sessions held February 16, March 16, and April 20.

Twenty-eight papers have been presented for publication, as follows:

Henry W. Fowler, 4; Adele M. Fielde, 2; E. G. Vanatta, 2; H. A. Pilsbry and James H. Ferris, 2; T. Barbour and G. K. Noble, 1; William H. Dall, 1; N. E. McIndoo, 1; H. Matsumoto, 1; James A. G. Rehn, 1; Albert P. Morse and Morgan Hebard, 1; James A. G. Rehn and Morgan Hebard, 1; William Churchill, 1; Stanislas Meunier, 1; Charles P. Alexander, 1; Edgar T. Wherry and S. G. Gordon, 1; John W. Harshberger, 1; S. Stillman Berry, 1; Clarence B. Moore, 1; Phineas W. Whiting, 1; Howard Crawley, 1; Burnett Smith, 1, and Nathan Banks, 1.

Twenty-one of these have been printed, four are awaiting publication, one appeared as a contribution to the JOURNAL, and two were returned to the authors.

Six hundred and sixteen pages of the PROCEEDINGS, illustrated by twenty-five plates, have been printed. The second part of the sixteenth volume of the JOURNAL has also been issued. It consists of a paper on the evolution of color pattern in a genus of Lepidoptera, by Miss Annette Frances Braun, and a beautiful addition to Mr. Clarence B. Moore's papers on his exploration of southern burial mounds, forming together three hundred and twenty-two pages and six plates. Miss Braun defrayed the cost of the two plates illustrating her paper and we are again indebted to Mr. Moore for the entire cost of publishing his contribution.

Of the TRANSACTIONS OF THE AMERICAN ENTOMOLOGICAL SOCIETY (Entomological Section of the Academy) five hundred and nine pages and twenty-four plates have appeared. The Section has also issued five hundred pages illustrated by twenty plates of the ENTOMOLOGICAL NEWS.

Eighty pages and ten plates have been added to the MANUAL OF

CONCHOLOGY, making the output of the year 2,027 pages and 85 plates.

The war has interfered with the distribution of these publications to correspondents as the International Bureau of Exchange has been forced to suspend communication with Belgium, Germany, Austria, Russia, Servia, Bulgaria, and Roumania. The several issues intended for these countries have, however, been directed and stored away in anticipation of the happier time when they can be sent to their destinations.

Four members and ten correspondents have been elected. The deaths of thirteen members and three correspondents have been announced. Resignations of membership were accepted from Walter M. James and Edwin B. Bartram.

George Vaux, Jr., was reappointed by the Council the Solicitor of the Academy; Frank J. Keeley was continued as Curator of the William S. Vaux Collections and Joseph Willcox as Custodian of the Isaac Lea Collection of Eocene fossils. Dr. Spencer Trotter was placed on the Library Committee to fill the vacancy caused by the death of Dr. Thomas Biddle.

The following courses of lectures have been delivered in connection with the Ludwick Institute: Witmer Stone, three on wild bird life; B. Franklin Royer, one on housing in relation to health; F. Herbert Snow, one on Philadelphia's water supply; Henry A. Pilsbry, three on problems in the study of faunas; Henry Skinner, three on entomology; Spencer Trotter, three on physiography and life relations of North America; Stewardson Brown, three on local wild flowers.

In harmony with the original intention of the Ludwick Foundation, ten additional lectures were delivered on Wednesday afternoons up to March to the teachers and classes of the Girls' High School.

A Committee of Conference with one representing the American Entomological Society considered carefully a modification of the articles of agreement providing for the union of the Academy and the Society, but the result was not reached in time to be included in this report.

Much the most important event in the history of the Academy during the past year was the adoption, January 19, of amendments to the By-Laws providing for the loaning of certain books from the Library, reducing the number of stated meetings to six, repealing the requirement of an initiation fee, and changing the procedure for the election of members.

These amendments were adopted January 19 on the recommendation of the Council and are as follows:

Chapter II, Art. 1: Change "the last stated meeting of the month" to "any stated meeting."

Art. 2: Change first sentence to read "Candidates for membership shall be nominated in writing by at least two members, who shall record the name and place of residence. The nominations shall be posted in the Hall of the Academy and read before a meeting of the Council and the candidate shall be balloted for at any subsequent stated meeting, provided that at least two weeks shall have elapsed since their nomination and posting."

Art. 3: Change "fee of initiation" to "first annual contribution."

Art. 4: Change "fee of initiation" to "first annual contribution."

Art. 11: Change "fee of initiation" to "the annual contribution."

Art. 13: Omit "an initiation fee of Ten Dollars and an" and substitute "the" for "an."

Art. 14: Omit "and all initiation fees."

Art. 17: Omit "who has not paid the initiation fee or."

Chapter IV, Art. 1: Omit the word "monthly" in the last sentence and alter "day" to "days," *i.e.*, to read: "days on which the meeting shall be held."

Chapter IX, Art. 3: Change to read "Certain books specified by the Librarian and the Library Committee may be loaned to members for a period of not exceeding one month. A list of such books shall be prepared for the consultation of members and books may be added to it or withdrawn from it at the discretion of the Librarian and the Library Committee. The Librarian shall keep a record of all books loaned with the dates of loan and return."

Chapter XII, Art. 1: Change the first clause to read "The stated meetings of the Academy shall be held on the third Tuesdays of November, December, January, February, March, and April."

Art. 5: Insert "stated" before "meetings" in the first line.

Art. 6: The first line should read "The order of business at the annual meetings shall be."

It will be seen that several of the amendments merely conform to the requirement of the changes specially referred to.

The effect of the By-Law authorizing the loaning of books is stated in the report of the Librarian.

On the adoption of these amendments a new edition of the By-Laws was printed and distributed.

The usual societies have held meetings in the Academy during the year.

EDWARD J. NOLAN, *Recording Secretary*.

REPORT OF THE CORRESPONDING SECRETARY.

The diminished volume of foreign correspondence and reduced number of international scientific congresses commented upon in the last annual report of the Corresponding Secretary were even more apparent in 1915, inasmuch as the conditions were operative throughout the entire year.

Death collected an unusually heavy toll from the roll of correspondents, including some of the most eminent, as follows: Léon Vaillant, James Geikie, A. A. W. Hubrecht, Richard Lydekker, Frederic W. Putnam, Theodor Boveri, George M. Sternberg, Edw. L. Greene, Orville A. Derby, and H. E. Dresser.

To insure a more systematic and careful examination into the qualifications of proposed candidates for correspondents, a committee of Council on the nomination of correspondents was appointed. Upon the recommendation of this committee the following named were nominated by the Council and elected by the Academy: Alfred C. Haddon, Wilhelm Ludwig Johannsen, William Trelease, Carl Diener, Samuel Wendell Williston, Charles E. Barrois, Thomas Chrowder Chamberlin, Albrecht Penck, William Bateson, and Stanislas Meunier.

The principal invitations received during the year were to the inauguration exercises of Edward Kidder Graham as President of the University of North Carolina, at which Professor H. V. Wilson served as the representative of this Academy; the twenty-fifth anniversary of the founding of The Nebraska Academy of Sciences, Professor George T. Moore being our representative; the commencement exercises of the University of Pittsburgh; the twenty-fifth annual meeting of the Ohio Academy of Science, to which Dr. Howard Ayers went as our delegate; the fiftieth anniversary of the administration of Alexander F. de Waldheim as Director of the Imperial Botanical Garden of Petrograd, which was acknowledged by a letter of congratulation; and to the postponed meeting of the Nineteenth International Congress of Americanists, which is to convene

in Washington this month and to which the Honorable Charles D. Walcott and Miss H. Newell Wardle were last year appointed delegates.

Letters thanking the Academy for courtesies extended during the Convocation Week meetings of 1915 were received from the American Association for the Advancement of Science, the Geological Society of America, and the American Fern Society.

Correspondence with individuals and institutions requesting information on a variety of subjects was conducted as usual.

Statistics of the correspondence transacted is shown in the following table:

Communications received:

Acknowledging receipt of the Academy's publications	160
Transmitting publications to the Academy	57
Requesting exchanges or the supply of deficiencies	1
Invitations to learned gatherings, celebrations, etc.	9
Notices of deaths of scientific men	10
Circulars concerning the administration of scientific and educational institutions, etc.	29
Photographs and biographies of correspondents	4
Letters from correspondents	13
Miscellaneous letters	100
Total received	383

Communications forwarded:

Acknowledging gifts to the library	1,155
Requesting the supply of deficiencies	124
Acknowledging gifts to the museum	134
Acknowledging photographs and biographies	5
Letters of sympathy or congratulation, addresses, etc.	7
Diplomas and notices of election of correspondents and delegates' credentials	17
Miscellaneous letters	180
Annual reports and circulars sent to correspondents	204
Total forwarded	1,826

Respectfully submitted,

J. PERCY MOORE, *Corresponding Secretary.*

REPORT OF THE LIBRARIAN.

During the past year 564 volumes, 5,858 pamphlets and periodicals, 135 maps, 3 sheets, and 1 photograph, a total of 6,561, have been added to the Library.

These additions have been derived from the following sources:

Exchanges	2,754	Publication Committee of the Academy	4
I. V. Williamson Fund	1,825	Wisconsin Geological and Natural History Survey	4
United States Department of Agriculture	532	Pennsylvania Water Supply Commission	3
American Entomological Society	298	Lowell Observatory	3
General Appropriation	292	Japan Society of America	3
J. A. Meigs Fund	136	University of Tennessee	3
Authors	91	Michigan Geological and Biological Survey	3
Editors	77	Ella B. Altman	3
United States Bureau of Education	62	Central Seismological Station in Pulkow	3
Pennsylvania Department of Agriculture	33	Bentham Trustees, Kew Gardens	2
Queensland Department of Mines, Geological Survey	33	University of Wyoming	2
New York Agricultural Experiment Station	31	Rockefeller Sanitary Institute for the Eradication of the Hook Worm	2
Imperial Department of Agriculture, British West Indies	30	American Institute of Electrical Engineers	2
Dr. Witmer Stone	24	State Board of Charities, New York	2
Pennsylvania Department of Health	20	Government of India	2
Commission Géologique de Finlande	18	Washington Geological Survey	2
Thos. B. Wilson Fund	15	Wistar Institute of Anatomy	2
Dr. Henry Skinner	15	Pennsylvania Department of Forestry	2
United States Department of the Interior	14	Pennsylvania State College	2
United States Department of Commerce and Labor	14	Hervas Laboratory of American Linguistics	2
Pan-American Union	12	Observatorio Astronomico de Madrid	2
American Iron and Steel Institute	12	Dr. W. D. Bayley	2
National Academy of Sciences	10	Goodsell Observatory	2
United States War Department	8	Clarence B. Moore	2
Library of Congress	8	Editors of Entomological News	1
Dr. Edward J. Nolan	8	Museum d'Histoire Naturelle de Havre	1
Department of Trade and Customs, Australia	8	Dr. Thomas Biddle	1
Sveriges Geologiska Undersökning	8	James F. Wood	1
New Mexico College of Agriculture	7	Pennsylvania Chestnut Tree Blight Commission	1
Florida State Geological Survey	7	Warren Academy of Sciences	1
Topographic and Geologic Survey of Pennsylvania	7	Iowa Geological Survey	1
Department of Fisheries, Bengal, Bihar and Orissa	7	Charles H. Townsend	1
Geological Survey of New Jersey	6	Gouvernements Kina Onder-neming te Tjinjireean (Bandong)	1
California Fish and Game Commission	6	Government of Formosa	1
Pennsylvania State Library	6	Colorado Museum of Natural History	1
Illinois State Geological Survey	5	Geological Survey of Alabama	1
Estacion Seismologica de Cartuja	5	Connecticut Geological and Natural History Survey	1
Argentine Government	5	United States Brewers' Association	1
Commission of Conservation, Canada	4	Delaware Valley Ornithological Club	1
William J. Fox	4	Los Angeles County Museum of History, etc	1
Seismological Society of America	4		
Indiana University	4		

Zoological Society of Philadelphia	1	Charles W. Richmond	1
Dr. William H. Dall	1	Nora C. Fretageot	1
Trustees of Estate of Lucy Hunter Baird	1	Commissioners on Fisheries and Game, Massachusetts	1
Geological Survey of Georgia	1	Hirase Conchological Museum	1
Imperial Institute for the Study of Infectious Diseases, Tokyo	1	Crosby Frisian Fur Company	1
Dr. Urie Dahlgren	1	Delaware County Institute of Science	1
Cuerpo de Ingenieros de Minas del Peru	1	Albert I. Prince de Monaco	1
Commissao de Linhas Telegraphicas Estrategicas de Matto Grosso	1	Game Commissioners of Pennsylvania	1
Pennsylvania Department of Fisheries	1	Dr. Charles K. Mills	1
Joseph Wilcox	1	Philadelphia Museums	1
		Japanese Commission to the Panama-Pacific International Exposition	1

They have been distributed to the several departments of the Library as follows:

Journals	4,593	Helminthology	17
Agriculture	657	Anthropology	17
Geology	517	Physical Sciences	16
Botany	139	Mineralogy	12
Entomology	102	Ichthyology	11
Geography	102	Herpetology	9
General Natural History	90	Mathematics	9
Anatomy and Physiology	60	Chemistry	8
Voyages and Travels	44	Mammalogy	8
Ornithology	30	Dictionaries	2
Conchology	23	Philology	1
Medicine	22	Miscellaneous (unclassified)	53
Bibliography	19		

The following are perhaps worthy of special mention:

- Bergsträsser, *Nomenclatur und Beschreibungen der Insekten*, etc., 4 parts in 2 vols., 1778-1780.
Howard, *British Warblers*.
Beccari, *Palmen de Madagascar*, 1914.
Esper, *Die europäischen Schmetterlinge*, 5 Theile in 12 vols.
Martyn, *Universal Conchologist*, 4 vols., 1784.
Hoppe, *Entomologisches Taschenbuch*, 2 vols., 1796-1797.
Borowski, *Gemeinrützige Naturgeschichte des Thierreichs*, 10 vols. in 8, 1780-1789.
Hoppe, *Ectypa Plantarum Ratisbonensium*, 8 vols., 1787-1793.
Ascanius, *Icones Rerum Naturalium*, 4 vols., 1772-1777.

The collection of journals and periodicals has been desirably increased by the addition of the following:

- Annals of Applied Biology*, London, I; II, 1-3.
Anthropologia, London, 1 volume, 1873-1875.
Aquatic Life, Philadelphia, I, 1-3.
Bolus Herbarium, Annals, Cape Town, I, 1, 2.
Caledonian Horticultural Society, Edinburgh Memoirs, 4 volumes, 1814-1829.
California Fish and Game, San Francisco, I, 1-5.
Chemie der Erde, Jena, I, 1.
Contribucion al Estudio de los Ciencias, etc., La Plata, N. 15.

- Cybele Columbiana, Washington, I, 1.
 Discovery, Philadelphia, I, 1.
 Gouvernements Kina-Onderneming te Tjinjirecan (Bandoeng), Batavia, 1913.
 Hawaiian Forester and Agriculturist, Honolulu, partial set of I-XII.
 Hervas Laboratory of American Linguistics, Bulletin, St. Louis, Nos. 4, 5.
 Illinois Biological Monographs, Urbana, I, 1-4.
 Instituto di Geografia, etc., Catania, Nos. 1-4.
 Jugoslavenska Akademija Znanosti i Umjetnosti, Isvjescao Rospravama Matem.-
 Priir. Razreda, No. 2; Prirodoslova Istrazivanja, etc., Matem.-Priir. Razreda,
 Nos. 1-3.
 Los Angeles County Museum of History, etc., Miscellaneous Publication, No. 1.
 Missouri Botanical Garden, Annals, I; II, 1-3.
 Mycological Bulletin, Columbus, imperfect set.
 National Academy of Sciences, Washington, Proceedings, I, 1-11.
 Natur und Heimat, Godesberg, Nos. 1-9.
 Ohio Naturalist, Columbus, complete.
 Pennsylvania Department of Forestry, Harrisburg, Bulletin Nos. 11, 12.
 Philippine Agricultural Review, Manila, V; VI; VIII, 1.
 Phytopathology, Baltimore, V, 1-5.
 Progrès Agricole et Viticole, Villefranche, XXXII-XXXVI.
 Queensland Department of Mines (Geological Survey, Brisbane, Annual Report,
 1901-1914; Publications, part of 119-239).
 Regensburgische Botanische Gesellschaft, Regensburg, Schriften I, 1792.
 Scientific Monthly, New York, I, 1-3.
 Société d'Études Scientifiques de l'Aude, Carcassone, Bulletin, I-VII, XI-XXIV.
 Société des Lettres, Sciences et Arts de Bar-le-Duc et Commercy, Bar-le-Duc,
 Bulletin Mensuel, 1913.
 University of Chicago, Bulletin of the Department of Anthropology, Nos. 1-5.
 Vorträge aus dem Gesamtgebiet d. Botanik, Berlin, 1.
 Walker Museum, Contributions, Chicago, I, 1-8.
 Zoologische Mededeelingen, Leiden, Afl. 1.

A well-bound copy of the Rev. J. G. Wood's *Animate Creation*, in three volumes, quarto, has been given to the Academy by Miss Ella B. Altemus, in memory of the late William Wilkinson Altemus.

The notable decrease in the number of additions to the Library during 1915 has been due to two causes: A lessening of appropriations, but more especially the interference with foreign correspondence by the horrible war which is, in one way or another, affecting every human interest, most of them disastrously. The German production of scientific publications was at first sustained, but is now decreasing. Out of sixty-nine German periodicals subscribed for nothing has been received from twenty-one of them. The English journals continue as usual, and the French, while much affected at first, are now for the most part going on as before the war. We have been warned by the Royal Academy of the Lincei, the Royal Academy of Sciences of Petrograd, and the Chemical Society of London that issues forwarded now must be at our risk, as losses, if any occur, will not be made up. In these cases it has been thought best to ask for a prompt supply of publications, assuming such risk as may be involved, for it will probably not be more than we should run in expecting the volumes in bulk at the end of the conflict.

Shipments from Germany and Austria were stopped by a British Order in Council in June. We are informed, however, that the British Government is now prepared to issue permits for shipment of scientific books to the United States from Germany and Austria if destined for universities, colleges, scientific societies or public bodies. We may profit during the coming year by this relaxation, although it is accompanied by a great deal of annoying red tape.

The interruption of exchange noted in the report of the Recording Secretary of course greatly affects the receipts from corresponding societies. Even when regular shipments are made invoices and bills of lading are held up on the other side and insufficient steamer accommodations cause uncertain deliveries.

Chapter IX, Art. 3, of the By-Laws was amended in January so as to permit of the loaning to members of certain books specified by the Librarian and the Library Committee for a period not exceeding one month.

Although it was held by Machure and his contemporaries that all books belonging to the Academy should be exclusively for use within the building, both for the good of those working on the premises and to lessen the danger of loss, it was considered that such a rule was not practicable until the services of a Librarian during portions of the day could be secured. Certain designated books were therefore permitted to be borrowed until 1850, when Thomas B. Wilson presented to the Academy the extremely valuable works which he had from time to time deposited with the understanding that they should never be loaned on any condition. This applied to such an important portion of the Library that the rule was then made general and from 1850 until last January no books were knowingly allowed to leave the building except to be bound.

Since the new rule has been in operation forty-six works in fifty-eight volumes have been borrowed. These have all been returned but two, which are now alone outstanding.

A system of registry of works taken for use in the Academy's study rooms has been adopted. 822 titles in 1,061 volumes have been placed at the service of students and workers in the building. 375 of these are still in use.

While a few of the books taken from the building have manifestly been for more or less desultory reading, the others have undoubtedly been for serious consultation and study, so that there is reason to believe that the operation of the new law is, as far as it goes, for the advancement of science without any counterbalancing disadvantage. By

direction of the Council, no volumes or parts of journals or periodicals may be borrowed without the special consent of the Librarian, who must be reasonably sure, before the publication is sent out, that the interests of those working on the premises will not be interfered with by the loan.

As required by the By-Law, a separate list of books that can be borrowed is being prepared and is nearing completion.

A very desirable subject index to the map collection has been prepared by Mr. Fox.

Forty-seven volumes of works not connected with the Academy's interests have been transferred to the Free Library of Philadelphia.

A framed photograph of Rembrandt Peale's oil portrait of Reuben Haines, who served most efficiently as Corresponding Secretary from February, 1814, to December, 1831, has been presented by his grandson, Reuben Haines.

A framed photograph from life of the late Dr. Benjamin Sharp has been received from Mrs. Sharp.

Through the liberality of a number of subscribers, there has been obtained a replica of the portrait of Baron Von Humboldt, painted from life in 1856 by J. R. Lambdin, and now in the rooms of the American Philosophical Society. The picture has been beautifully framed by the President of the Academy.

It is pleasant to again acknowledge the good work done by William J. Fox and Furman Sheppard Wilde, both in the Library and in connection with the issue of the publications.

EDWARD J. NOLAN, *Librarian*.

REPORT OF THE CURATORS.

The completion of the year 1915 finds the Academy's buildings and collections in excellent condition. Much important work has been accomplished in studying, arranging, and cataloguing material in the several departments of the Museum, and many important accessions have been received through gift or purchase.

The number of visitors to the Museum has steadily increased, especially classes from the schools of Philadelphia and vicinity which come to study the exhibits under the guidance of their teachers.

At the last session of the State Legislature the sum of \$10,000 was appropriated to the Academy for the purchase of cases, and arrangements have been made to furnish the north wing of the Museum with exhibition cases so that it may be reopened to the public during

the ensuing year, and to provide much needed exhibition and storage cases in the various departments.

During the past year the Curators have purchased three large mahogany and plate-glass exhibition cases, one for a group of buffalo and two for the collection of wood of native forest trees. Two horizontal oak cases have also been procured for the William S. Vaux archæological collection, as well as eighteen metal storage cases, 450 trays and 100 insect boxes.

Mr. Clarence B. Moore continued his explorations among the Indian mounds of the Southern States, the results of which have been generously added to the Clarence B. Moore Collection.

A valuable collection of Antarctic material obtained on Sir Ernest Shackleton's expedition was presented by Mr. John H. McFadden. The framed photographs of scenery and animals have been placed on exhibition in the lower hallways and the other specimens arranged in the several departments.

Leave of absence was granted to several members of the Museum staff for the prosecution of field work. Through the liberality of Mr. Morgan Hebard, Mr. J. A. G. Rehn was enabled to accompany him on a two months' trip through the Gulf States from northern Florida to eastern Texas, for the purpose of studying the Orthoptera of the region, one-half of the material obtained becoming the property of the Academy.

Dr. Henry A. Pilsbry spent the greater part of August and September in an exploration of the Black Range of New Mexico, obtaining large series of land mollusks, part of them new to science, as well as collections of reptiles and plants.

Mr. Stewardson Brown accompanied Dr. and Mrs. N. L. Britton on a botanical expedition to Porto Rico, and Dr. Witmer Stone did some general collecting in California and Minnesota, incidental to attending the meeting of the American Ornithologists' Union in San Francisco.

The usual amount of local field work was also carried on.

Details of Museum work in the various departments follow.

MAMMALS.

A fine group of three buffalo, a bull, cow and calf, which had been previously mounted, was arranged in a large exhibition case secured during the year. It adds much to the attractiveness of the mammal hall.

The skeletons of the Right, Hump-back and Sperm Whales have

been articulated and mounted in the centres of the geological and mineralogical halls and attract much attention. This work was done by the Academy's taxidermist, Mr. David McCadden, assisted by Mr. E. W. Stucke.

The collection of skins of the larger mammals was carefully gone over during the year and systematically arranged by Dr. Witmer Stone, while the entire osteological collection was systematized and labelled by Mr. Earl L. Poole, a student on the Jessup Fund. This collection is now readily accessible and its usefulness vastly increased.

Twenty-six mammals have been received from the Zoological Society of Philadelphia during the year, which have been variously prepared by the taxidermist as skins or osteological material.

A set of the McGregor restorations of *Pithecanthropus* and other early anthropoid and human types was presented by Dr. Samuel G. Dixon.

Numerous students have made use of the collections during the year and specimens have been loaned to Drs. J. A. Allen and C. Hart Merriam, Messrs. W. H. Osgood and H. W. Henshaw.

BIRDS.

The rearrangement and renovation of the study series of birds have progressed satisfactorily during the year and only five families of the Passeres and the Steganopodes still demand attention. Mr. D. E. Culver, student on the Jessup Fund, has relaxed the old unmounted specimens and remade many of the skins, while Dr. Witmer Stone has systematically arranged and labelled the groups as they were completed. He has also entirely rearranged the local study series of land birds, bringing all of the local material together for the first time.

A number of specimens have been identified for the Zoological Society and for correspondents.

Mr. Samuel N. Rhoads, accompanied by Mr. Earl L. Poole, undertook an expedition to Guatemala, from February to April, in the interests of the Academy, the expenses being met partly by the Academy and partly by Mrs. Beulah M. Rhoads and William P. Elkinton.

A fine series of about 700 birds, a number of mammals and some specimens in other branches were obtained.

Besides this material an additional series of birds from Santa Marta, Colombia, was purchased, as well as a series of Petrels from South Georgia Island.

The Delaware Valley Ornithological Club has added a number of rare and valuable specimens to the local collection and other local material was received from various sources.

Six metal-covered storage cases were substituted for the old wooden cases formerly used for the larger birds and the specimens arranged to much better advantage. By the end of next year it is expected that the entire collection of skins will be accommodated in metal cases.

Mr. James P. Chapin spent two days studying the Academy's type series of West African birds and Mr. Rhoads has spent considerable time in the department preparing a report on his Guatemala collection.

Many local students have made use of the study collection and specimens have been loaned to Drs. F. M. Chapman, C. W. Richmond, Messrs. R. Ridgway, W. E. C. Todd, C. B. Cory, H. K. Coale and R. C. Murphy.

REPTILES AND BATRACHIANS.

This department has, as in 1914, been under the charge of Mr. Henry W. Fowler. All accessions have been identified and cared for, 153 having been tagged, catalogued and distributed. The entire series of Salamanders has been critically studied and rearranged and a collection of reptiles and batrachians from Porto Rica has been identified for Princeton University, in return for which service the Academy received a fine series of duplicates. Mr. E. R. Dunn has spent much time studying the collections in this department and Dr. Thomas Barbour spent two days examining some of the types. Several specimens were loaned to Dr. Barbour.

FISHES.

In this department, which is also under Mr. Fowler's care, much important work has been accomplished. Mr. Fowler has catalogued, labelled and distributed 3,648 specimens during the year. He has also prepared and published papers on collections of fishes from Canada and tropical America, and has made a critical study of the Killi-fishes and their allies.

MOLLUSKS.

Dr. Henry A. Pilsbry, special curator of this department, reports that accessions have been received during the year from 82 persons and institutions. Among the more extensive accessions are a series

from Washington and Oregon, received from Mr. John A. Allen; Antarctic shells of the Sir Ernest Shackleton Expedition, from Mr. John H. McFadden, and Mexican shells from C. R. Orcutt. Messrs. Clarence B. Moore, Morgan Hebard, S. S. Berry and others have made many gifts of southern and western shells, and Mr. Bayard Long has continued his collections in New Jersey.

The John Ford collection of *Olividae*, purchased during the year, when added to that of the Academy, forms probably the most extensive series of these shells in any museum.

With Mr. James H. Ferriss, the special curator spent the greater part of August and September in an exploration of the Black Range of New Mexico, obtaining large series of land mollusks, part of them new to science.

We have also been favored with a complete series of the mollusks taken by Messrs. Junius Henderson and D. E. Daniels, who collected in many localities from Provo, Utah, to Franklin in southern Idaho.

The study of Hawaiian material of the expedition of 1913 has been continued throughout the year. The family *Tornatellinidae* has been completed, and a monograph published in the *MANUAL OF CONCHOLOGY*, Volume XXIII. The proportion of undescribed forms proved to be unusually large, the volume containing descriptions of 103 new species and 29 new subspecies. Dr. C. Montague Cooke, of the Bishop Museum, Honolulu, collaborated with the special curator in this work.

Mr. E. G. Vanatta, assistant in the department, has been chiefly occupied in the determination and labelling of specimens received. Miss Caroline Ziegler has continued the work of cataloguing the collection.

The Wheatley collection of fresh-water shells has been deposited by the University of Pennsylvania, and some progress has been made in cleaning, labelling and cataloguing the specimens.

During the year the collections have been studied by Messrs. George H. Clapp, Frank M. Anderson, Drs. W. H. Dall and A. Olssen, while material has been loaned to Drs. W. H. Dall and Paul Bartsch, Messrs. Junius Henderson and J. B. Henderson.

INSECTS.

Dr. Henry Skinner, head of the department of Insects, reports that much of his time and that of Mr. E. T. Cresson, Jr., has been devoted to relaxing and mounting the new material acquired. Portions of the collection have also been rearranged in the new cases procured during the year.

In the order Diptera the families Tipulidæ and Dolichopodidæ have been rearranged.

In the Coleoptera the labelling of the Horn types has been continued and the rearrangement of the family Scarabæidæ completed.

In the Hymenoptera, the rearrangement of the Ophionini and Pimplinæ has been finished.

In the Lepidoptera, the Welles collection was safely transported from Elwyn, Pa., and the following families rearranged: Agrotinæ, Syntomidæ, Saturnidæ, Lycænidæ, and the exotic Nymphalidæ and part of the Pieridæ. The genera *Kallima*, *Papaipema* and *Autographa* were also rearranged.

In the Orthoptera the series of the genera *Orchelimum*, *Conocephalus* and *Atlantius* have been rearranged in the new type of double box, which was all the general rearrangement possible during the year with the few boxes available.

Mr. J. A. G. Rehn spent two months in the field in company with Mr. Morgan Hebard, working in the Gulf States from northern Florida to eastern Texas. The trip, which was highly successful, resulted in securing a very large series from the most neglected portion of the eastern States, of which collection the Academy will receive one-half.

Mr. Hebard has continued his studies, based very largely on the material in his own collection, here deposited, and in the Academy series. He has also continued to maintain a preparator, whose services as in the past have been given very liberally to the Academy. By his aid it was possible to have mounted practically all the previously unmounted Orthoptera owned by the Academy. In collaboration with Mr. Hebard, Mr. Rehn has completed the final portion of an extensive paper on the Orthoptera of the southeastern United States, which was based largely on the field work conducted under the auspices of the Academy. The same authors have made a synoptical study of the genus *Atlantius* and progress has been made on a similar treatment of the genus *Mermiria*.

Mr. Rehn has been and is at present engaged in studying extensive Brazilian collections, of which the Academy will receive the first set of such material as it does not already possess. He has also made some additional progress with the study of the extensive African collections placed in his hands by other institutions, but owing to the greater urgency of other work this has been temporarily laid aside.

A large number of visiting entomologists have studied the collec-

tions, including Messrs. A. F. Satterthwait, A. P. Morse, E. Daecke, C. W. Long, W. T. Davis, J. C. Bradley, Charles Schaeffer, J. C. Crawford, S. A. Rohwer, A. B. Gahen, R. A. Cushman, A. N. Caudell, and A. Avinoff.

Material has been loaned to Dr. E. M. Walker.

OTHER INVERTEBRATES.

Mr. H. W. Fowler has looked after the alcoholic material and arranged numerous small local collections of spiders, crustacea, etc. Mr. J. H. Emerton has studied the series of spiders during the year. Specimens of annelids have been loaned to Dr. C. A. Kofoed, and J. F. Daniel.

INVERTEBRATE FOSSILS.

Dr. A. P. Brown has spent considerable time at the Academy during the summer months studying the collections in this department and in conjunction with Dr. Pilsbry has prepared a report on the Oligocene fossils obtained by Mr. Lloyd B. Smith in Colombia.

Drs. A. Olsen and L. W. Stephenson have spent some time studying the collections, and material has been loaned to F. W. Stanton and T. Wayland Vaughan.

VERTEBRATE FOSSILS.

The large slabs of fossil footprints together with certain geological specimens have been arranged on the wall spaces between the windows in the mineralogical hall.

Material was loaned during the year to Drs. O. P. Hay and J. C. Merriam, and in return for the courtesy Dr. Merriam presented the Academy with a specimen of *Smilodon* from the asphalt deposits of the Rancho La Brea, California.

HERBARIUM.

Mr. Stewardson Brown's continued illness has again kept him from his duties in charge of the Herbarium for about half of the past year, while for several months he was absent with Dr. N. L. Britton on a collecting trip to Porto Rico.

During his absence the Academy has again been dependent upon the voluntary services of Messrs. Bayard Long and S. S. Van Pelt, who have generously looked after the general herbarium in addition to their continued care and development of the local herbarium in which they have interested themselves for a number of years.

Work has necessarily been mainly confined to caring for the accessions. Miss Ada Allen has continued with the mounting of the specimens and has prepared for cataloguing and distribution 3,150 sheets. Mr. Van Pelt has mounted all accessions to the local collection, amounting to 3,114 sheets and including 664 from the Porter herbarium, which have been distinctively labelled in accordance with the agreement with Lafayette College, by which institution they were deposited.

Mr. Long has distributed and identified material added to the local herbarium and made critical studies of various groups. He has also attended to much correspondence in connection with the general collection.

The herbarium has been consulted during the year by Dr. C. S. Sargent, W. W. Eggleston, Harold St. John, Francis Pennell and many others, and specimens have been loaned to W. W. Eggleston, P. C. Standley, Dr. R. H. Howe, Dr. J. C. Arthur, K. K. McKenzie, B. H. Smith, Dr. C. S. Sargent, Dr. F. Pennell, Harold St. John, Dr. J. M. Greenman, Prof. M. L. Fernald.

The collection of trunk sections of native trees of the Alleghanies presented by Mr. C. H. Jennings has been prepared for exhibition and placed in two mahogany and plate-glass cases in the mineralogical hall just outside the entrance to the herbarium, where it attracts much attention.

MINERALS AND ROCKS.

Mr. S. G. Gordon, under the direction of Mr. Frank J. Keeley, Curator of the William S. Vaux Collections, has completed a check list of minerals according to the sixth edition of Dana's *Manual* as an aid in the rearrangement of the collection which will be undertaken during the coming year.

Several of the cases in the hall were rearranged and part of the specimens transferred to cases presented by the Curwin Stoddart Estate.

Mr. Gordon has also redetermined most of the rock specimens and in part relabelled them, while many minerals in the general collection have also been redetermined. Many members of the Geological Society of America took occasion to examine the collections during the annual meeting of the Society at the Academy, in December, 1914.

ARCHÆOLOGY AND ETHNOLOGY.

Mr. Clarence B. Moore has placed on exhibition in this department the material obtained on his expeditions during the year.

Two additional exhibition cases were obtained by the William S. Vaux Fund for the display of the European archæological material in that collection, chiefly from Scandinavia and Switzerland.

Miss H. N. Wardle has cared for the collections during the year and rearranged portions of the display, preparing a number of new labels.

Besides the material in the Vaux collection, the specimens in the Gottschall collection from the Frazer and Thompson Rivers, B. C., and from Washington, Oregon, Montana, and the Shasta tribes of California, have been catalogued and displayed.

A rearrangement of some of the cases has added much-needed floor space and given uniformity of aspect.

CURATORS	{	WITMER STONE, <i>Chairman.</i>
		SAMUEL G. DIXON.
		HENRY A. PILSBRY.
		HENRY TUCKER.

REPORT OF THE CURATOR OF THE WILLIAM S. VAUX COLLECTIONS.

During past year new cases have been purchased and installed, under the supervision of the Curators of the Academy, for the display of the archæological collection.

There have been few accessions to the mineral collection, as it has been considered advisable to defer any extensive purchases until the completion of the contemplated rearrangement.

Respectfully submitted,

F. J. KEELEY, *Curator Wm. S. Vaux Collection.*

REPORTS OF THE SECTIONS.

BIOLOGICAL AND MICROSCOPICAL SECTION.—The Section has held seven stated meetings during the year, with the usual attendance.

A serious loss to our membership is the death of Dr. Benjamin Sharp, whose coöperation for many years is remembered gratefully. Suitable resolutions have been spread upon the Minutes.

Communications on the favorite subjects of investigation by different members have been numerous. Among those contributing

are the following: J. Cheston Morris, T. Chalkley Palmer, Frank J. Keeley, Thomas S. Stewart, Hugo Bilgram, and Charles S. Boyer.

At the annual election of officers, the following were chosen for the year 1916:

<i>Director</i>	J. Cheston Morris,
<i>Vice-Director</i>	T. Chalkley Palmer.
<i>Recorder</i>	Charles S. Boyer.
<i>Treasurer</i>	Thomas S. Stewart,
<i>Conservator</i>	Frank J. Keeley.
<i>Corresponding Secretary</i>	Silas L. Schumo.

CHARLES S. BOYER, *Recorder*.

ENTOMOLOGICAL SECTION.—The meetings of the Section have been well attended during the year and the communications made have been published. A large amount of valuable material has been added to the collection. Two members and a contributor have been elected. At a meeting held December 13 the following officers were elected to serve for the ensuing year:

<i>Director</i>	Philip Laurent.
<i>Vice-Director</i>	R. C. Williams.
<i>Treasurer</i>	Ezra T. Cresson.
<i>Secretary</i>	J. A. G. Rehn.
<i>Recorder</i>	E. T. Cresson, Jr.
<i>Publication Committee</i>	E. T. Cresson,
	Philip P. Calvert,
	E. T. Cresson, Jr.

HENRY SKINNER, *Recorder*.

BOTANICAL SECTION.—The Conservator spent most of February and March in Porto Rico in company with Dr. and Mrs. N. L. Britton, of the New York Botanical Garden, and Prof. John F. Cowell, of the Buffalo Botanical Garden. Sets of more than 2,500 herbarium numbers were collected, in addition to many living plants for the gardens. The Academy has received its share of the collections, which is being prepared for the general series. Other important additions are a number of New England plants collected by Mr. Bayard Long and Prof. M. L. Fernald.

More than 3,000 sheets of plants, received from various members of the Philadelphia Botanical Club, have been mounted for the local herbarium by Mr. S. S. Van Pelt.

A detailed list of accessions to the herbarium will be found in the Additions to the Museum.

The Conservator wishes to record his appreciation of the valuable assistance rendered, during his absence through illness, by Mr. Bayard Long in caring for certain details of the work of the herbarium.

Miss Ada Allen has continued her services during the year as aid in the herbarium.

The American Fern Society held its meeting in the herbarium of the Academy, December 28 and 29. On the evening of December 31 the Section gave a reception and smoker to the botanists attending the meetings of the American Association for the Advancement of Science, when we had the pleasure of welcoming more than 200 visitors in the herbarium. The occasion afforded many their first opportunity of examining the collections.

The following officers of the Section have been elected for the ensuing year:

<i>Director</i>	Benjamin H. Smith.
<i>Vice-Director</i>	Joseph Crawford.
<i>Recorder</i>	John W. Eckfeldt, M.D.
<i>Treasurer and Conservator</i>	Stewardson Brown.

Respectfully submitted,

STEWARDSON BROWN, *Conservator*.

MINERALOGICAL AND GEOLOGICAL SECTION.—The Section held four meetings, with about the usual average attendance.

Communications were made by Thomas C. Brown, on the Geology and Fossil Corals of Jefferson County, Kentucky, and on the Shawangunk and Green Pond Conglomerate; and by F. Lynwood Garrison, on Alluvial Gold Deposits in Alaska and elsewhere. Other subjects of geological or mineralogical interest were discussed.

There were three field excursions, with an average attendance of seventeen. The parties visited: (1) The crystalline rocks and their minerals between Avondale and Morgan Station, Delaware County; (2) the New Red Norristown Shales and No. 11 Limestone in Buckingham Township, Bucks County; (3) the gneiss and its minerals near Crum Creek, Delaware County.

The following officers of the Section have been elected for the year 1916:

<i>Director</i>	Benjamin Smith Lyman.
<i>Vice-Director</i>	F. J. Keeley.
<i>Recorder and Secretary</i>	S. L. Schumo.
<i>Treasurer</i>	William B. Davis.
<i>Conservator</i>	George Vaux, Jr.

Respectfully submitted by order of the Section,
 BENJ. SMITH LYMAN, *Director*.

ORNITHOLOGICAL SECTION.—The Section has maintained an active interest in the ornithological department of the Academy and in furthering study in this branch of science.

The Pennsylvania Audubon Society and Delaware Valley Ornithological Club have been encouraged to hold their meetings at the Academy and in this way many persons interested in bird study have come into closer relation with the society, resulting in important additions to the collection and in the acquisition of important data.

At the annual meeting of the Section the following officers were elected for the ensuing year:

<i>Director</i>	Spencer Trotter.
<i>Vice-Director</i>	George Spencer Morris.
<i>Recorder</i>	Stewardson Brown.
<i>Secretary</i>	William A. Shryock.
<i>Treasurer and Conservator</i>	Witmer Stone.

Respectfully submitted,
 WITMER STONE, *Conservator*.

The annual election of Officers, Councillors, and Members of the Committee on Accounts was held December 21, with the following result:

PRESIDENT.....	Samuel G. Dixon, M.D., LL.D.
VICE-PRESIDENTS.....	Edwin G. Conklin, Ph.D., Sc.D., John Cadwalader, A.M.
RECORDING SECRETARY.....	Edward J. Nolan, M.D.
CORRESPONDING SECRETARY.....	J. Percy Moore, Ph.D.
TREASURER.....	George Vaux, Jr.
LIBRARIAN.....	Edward J. Nolan, M.D.
CURATORS.....	Samuel G. Dixon, M.D., LL.D., Henry A. Pilsbry, Sc.D., Witmer Stone, A.M., Sc.D., Henry Tucker, M.D.

COUNCILLORS TO SERVE THREE YEARS	Philip P. Calvert, Ph.D., Frank J. Keeley, Walter Horstmann, William Pepper, M.D.
COMMITTEE ON ACCOUNTS	Charles Morris, Samuel N. Rhoads, John G. Rothermel, Thomas S. Stewart, M.D., Walter Horstmann.

COUNCIL FOR 1916.

- Ex-Officio*.—Samuel G. Dixon, M.D., LL.D., Edwin G. Conklin, Ph.D., John Cadwalader, A.M., Edward J. Nolan, M.D., J. Percy Moore, Ph.D., George Vaux, Jr., Henry A. Pilsbry, Sc.D., Witmer Stone, A.M., Sc.D., Henry Tucker, M.D.
- To serve three years*.—Philip P. Calvert, Ph.D., Frank J. Keeley, Walter Horstmann, William Pepper, M.D.
- To serve two years*.—Charles B. Penrose, M.D., LL.D., Ph.D., Charles Morris, Spencer Trotter, M.D., William E. Hughes, M.D.
- To serve one year*.—Edwin S. Dixon, Henry Skinner, M.D., Sc.D., Robert G. LeConte, M.D., George Spencer Morris.

COUNCILLOR	George Vaux, Jr.
CURATOR OF MOLLUSCA	Henry A. Pilsbry, Sc.D.
CURATOR OF WILLIAM S. VAUX COLLECTIONS	Frank J. Keeley.
CUSTODIAN OF ISAAC LEA COLLECTION	Joseph Willcox.
ASSISTANT LIBRARIAN	William J. Fox.
ASSISTANTS TO CURATORS	Henry Skinner, M.D., Sc.D., Stewardson Brown, J. Percy Moore, Ph.D., Edward G. Vanatta, Henry W. Fowler, James A. G. Rehn, Ezra T. Cresson, Jr.
ASSISTANT IN LIBRARY	Furman Sheppard Wilde.
AID IN ARCHÆOLOGY	Harriet Newell Wardle.
AID IN HERBARIUM	Ada Allen.
<i>Taxidermist</i>	David M. McCadden.

Janitors.....

Charles Clappier,
Daniel Heckler,
James Tague,
Jacob Aebley,
Adam E. Heckler.

STANDING COMMITTEES, 1916.

FINANCE.—John Cadwalader, A.M., Edwin S. Dixon, Effingham B. Morris, Walter Horstmann, and the Treasurer.

PUBLICATIONS.—Henry Skinner, M.D., Sc.D., Witmer Stone, Sc.D., Henry A. Pilsbry, Sc.D., William J. Fox, Edward J. Nolan, M.D.

LIBRARY.—Henry Tucker, M.D., George Vaux, Jr., Frank J. Keeley, Thomas Biddle, M.D., Witmer Stone, Sc.D.

INSTRUCTION AND LECTURES.—Henry A. Pilsbry, Sc.D., Charles Morris, Henry Tucker, M.D., George Spencer Morris, and Stewardson Brown.

ELECTIONS IN 1915.

MEMBERS.

January 19.—Heber Wilkinson Youngken, Ph.D., George B. Benners.

February 16.—Joseph C. Guernsey, M.D.

March 16.—Jacob Parsons Schaeffer, M.D.

CORRESPONDENTS.

November 16.—Alfred C. Haddon, M.D., of Cambridge, England.

Wilhelm Ludwig Johannsen, M.D., of Copenhagen.

William Trelease, LL.D., of Urbana, Ill.

William Bateson, D.Sc., of Merton, England.

Carl Diener, Ph.D., of Vienna.

Samuel Wendell Williston, Ph.D., of Chicago.

Charles E. Barrois, LL.D., of Paris.

Thomas Chrowder Chamberlain, LL.D., of Chicago.

Albrecht Penck, Ph.D., of Berlin.

Stanislas Meunier, D.Sc., of Paris.

ADDITIONS TO THE MUSEUM.

1915.

MAMMALS.

CUGLEY & MULLIN. Capuchin Monkey (*Cebus* sp.).

SAMUEL G. DIXON, M.D. Restorations of skulls and heads of *Pithecanthropus*, the Neanderthal and Piltown men.

FREE MUSEUM OF SCIENCE AND ART OF THE UNIVERSITY OF PENNSYLVANIA. Pair of Lesser Kudu (*Ammelaphus imberbis*) horns, pig tusk, rhinoceros tail and worked antler.

H. W. FOWLER. Skeleton of Dolphin (*Delphinus delphis*), Riverton, N. J.

CHARLES GROVES. Moose (*Alces americanus*), Ontario. Young. Skin.

GUY KING. Female Opossum (*Didelphis virginianus*) with young in pouch.

BAYARD LONG. Jumping Mouse (*Zapus hudsonicus*), Spray Beach, N. J.

THOMAS MARTINDALE. Skin and skull of female Alaskan Brown Bear (*Ursus kiddlei*?), Cook Inlet, Alaska.

W. E. MEEHAN (PHILADELPHIA AQUARIUM). California Sea-lion (*Zalophus californianus*).

MRS. CURWEN STODDART, JR. Collection of eight mounted heads and horns of game mammals.

ZOOLOGICAL SOCIETY OF PHILADELPHIA. Mounted: Rufous Rat Kangaroo (*Epyprymnus rufescens*). Prepared as skin and skeleton; Siberian Tiger (*Felis tigris mongolica*); Jaguar (*Felis onca*); Philippine Spotted Deer (*Rusa alfredi*); Saddle-backed Tapir (*Tapirus indicus*); Sooty Agouti (*Dasyprocta nigra*). Prepared as skin and skull: Celebean Macaque (*Magus ochraceus*); Geoffroy's Spider Monkey (*Ateles geoffroyi*); Red Ruffed Lemur (*Lemur varius ruber*); Galago (*Galago* sp.); Serval (*Felis serval*); four Northwestern Pine Martens (*Mustela caurina*); American Otter (*Lutra canadensis*); Rusty-spotted Genet (*Genetta rubiginosa*); Leche Waterbuck (*Onotragus lechei*); Alleghany Cave Rat (*Neotoma pennsylvanica*). Prepared as skins: Mahol's Galago (*Galago maholi*); Golden Cat (*Felis temminckii*); Chaus Cat (*Felis chaus*), female and two young; California Sea-lion (*Zalophus californianus*); South African Hedgehog (*Erinaceus frontalis*); young Northern Warthog (*Macrocephalus africanus*). Prepared as skeleton: Mountain Zebra (*Equus zebra*); young male Mearns's Deer (*Odocoileus texana*); white-tailed gnu (*Connochætes gnu*). Prepared as skull: Sooty Mangabey (*Cercocebus fuliginosus*); Black Lemur (*Lemur macaco*); Galago (*Galago* sp.); South African Hedgehog (*Erinaceus frontalis*).

BIRDS.

W. M. ALDRICH. Collection of hummingbirds, birds' nests and eggs.

DELAWARE VALLEY ORNITHOLOGICAL CLUB. Four nests of Pennsylvania birds.

SAMUEL G. DIXON, M.D. Egg of Cardinal (*Cardinalis cardinalis*).

FREE MUSEUM OF SCIENCE AND ART OF UNIVERSITY OF PENNSYLVANIA. Bird of Paradise (*Paradisea apoda*).

W. W. JUSTICE. Collection of Eggs of Pennsylvania and New Jersey birds comprising 76 sets.

JOHN H. McFADDEN. Series of mounted Antarctic marine birds and eggs; Sir Ernest Shackleton's Collection.

D. C. McKEE. Virginia Rail (*Rallus virginianus*), Philadelphia.

S. W. MORTON, M.D. Mounted specimen of Mynah (*Gracula intermedia*).

PURCHASED. Collection of 176 Colombian birds, 16 petrels, S. Georgia Island, and 700 birds from Guatemala.

S. N. RHOADS. Skins of male Cape May Warbler (*Dendroica tigrina*) and young Starling (*Sturnus vulgaris*), Haddonfield, N. J.

W. HINCKLE SMITH. Black-crowned Night Heron (*Nycticorax nycticorax naevius*), Bryn Mawr, Pa.

C. FRANK S. STEAD. Skin of Red-tailed Hawk (*Buteo borealis*), Pennsylvania.

MRS. CURWEN STODDART, JR. Three mounted owls.

H. R. WHARTON, M.D. Skin of American Merganser (*Mergus americanus*), Salem, N. J.

ROBERT WILLETS. American Coot (*Fulica americana*), Barrel Island, N. J.

ZOOLOGICAL SOCIETY OF PHILADELPHIA. Prepared as skins: Black-footed Penguin (*Spheniscus dimersus*); young Swan (*Olor* sp.); Falcated Seal (*Eunetta falcata*); Victoria Crowned Pigeon (*Goura victoria*); Audubon's Caracara (*Polyborus cheriway*); Yellow-billed Hornbill (*Lophoceros leucomelas*); Blue-bellied Lorikeet (*Trichoglossus rubritorques*); Nepaul Parakeet (*Palæornis nepaulensis*); Blue-winged Green Bulbul (*Chloropsis hardwickii*).

REPTILES AND AMPHIBIANS.

PHILIP LAURENT. Small series of Salamanders, Chestnut Hill, Philadelphia.

P. LORILLIERE. Tree-toad (*Hyla vittata*), Georgetown, Md.

JOHN H. McFADDEN. One lizard; Sir Ernest Shackleton's Collection.

J. PERCY MOORE, Ph.D. Type of *Leurognathus marmoratus* Moore, Roan Mountain, N. C.

MUSEUM OF COMPARATIVE ZOOLOGY (in exchange). *Anolis bimaculatus*, *A. luteosignifer*, *Amiwa aquilina* Garman (paratype) and *A. atrigularis* Garman (paratype).

H. A. PILSBRY, Sc.D. Two lizards, Kahookawe, Hawaii.

PURCHASED. Collection of amphibia, Costa Rica.

C. T. RAMSDEN. Small collection of reptiles and amphibians. Guantanamo, Cuba.

R. D. SPENCER. Black specimen of Ring-neck Snake (*Storeria occipitomaculata*), Lycoming County, Pa.

ZOOLOGICAL SOCIETY OF PHILADELPHIA. Skin and shell of Red-eared Terrapin (*Pseudemys elegans*), Oldman's Creek, N. J. Arizona Mud Turtle (*Kinosternon henrici*).

FISHES.

C. S. ABBOTT, JR. Jar of fishes, Rockhall, Md.

LEE ADAMS. Dolphin (*Coryphæna hippurus*), Ocean City, N. J.

FISH AND GAME COMMISSION OF THE STATE OF MAINE, THROUGH H. B. AUSTIN. Collection of fresh-water fishes, Otter Pond Camp, Maine.

W. T. DAVIS. Brook Lamprey (*Lampetra apyptera*), Northern New Jersey.

H. W. FOWLER. Jar of fishes, Bucks County, Pa.; several small fishes, Scott's Creek, Pa.

EDWARD N. FOX. Flying fish (*Cypsilurus*); three small fishes, Sea Isle City, N. J.
FREE MUSEUM OF SCIENCE AND ART OF UNIVERSITY OF PENNSYLVANIA
Shark's jaw and saw of Saw-fish (*Pristis*).

MORGAN HEBARD. Remora (*Leptcheueis naucrates*), Florida.

HEBARD-ACADEMY EXPEDITION OF 1915. Two bottles of small fishes, Carra-belle, Fla.

F. J. KEELEY. Two fishes, Hawk's Park, Fla.

MRS. M. K. LANGSDORF. Saw of sawfish (*Pristis*).

D. N. McCADDEN. Young of Pompano (*Trachinotus carolinus*) and Tautog (*Tautoga onitis*), Ocean City, N. J.

JOHN H. McFADDEN. Flying fish (*Exocoetus volitans*); Sir Ernest Shackleton's Collection.

W. E. MEEHAN. Two fishes (*Alutera schapfi* and *Trachinotus carolinus*) Atlantic City, N. J.

RICHARD M. ABBOTT. Collection of fishes, Trinidad, St. Lucia and Grenada, West Indies.

PURCHASED. Collection of fishes, Costa Rica and Canal Zone.

B. SMITH, M.D. Wall-eyed Pike (*Stizostedion vitreum*), Canada.

RECENT MOLLUSCA.

CHARLES C. ABBOTT, M.D. One *Chione* from Trinidad.

C. S. ABBOTT, JR. *Melampus lineatus* Say from Rockhall, Md.

RICHARD M. ABBOTT. *Strophocheilus oblongus* Müll. from near Georgetown, Grenada.

JACOB AEBLY. Three species of land and fresh-water shells from Pennsylvania and New Jersey.

BENJAMIN ALBERTSON. Ten species of marine shells from Massachusetts.

JOHN A. ALLEN. One hundred and sixty-six trays of shells from Oregon and Washington.

F. C. BAKER. Six trays of land and fresh-water shells from Corea and New York.

FRED BAKER, M.D. Three marine shells from California.

M. J. BECKER. Eleven trays of shells from the Philippine Islands and California.

CONRAD BERENS, M.D. *Ostrea virginica* Gmel. from Crisfield, Md.

BERNICE PAUAI BISHOP MUSEUM. Seventy-three trays of Hawaiian land shells (in exchange).

S. S. BERRY. Twenty-six trays of shells from Montana and California.

E. BETHEL. *Oreohelix haydeni* Gabl. from Glenwood Springs, Colo.

J. C. BLUMER. Eight trays of land shells from Arizona.

A. P. BROWN, Ph.D. Two land shells from Anguilla.

W. A. BRYAN. Eight trays of Hawaiian shells.

H. H. BURTON. *Succinea ovalis* Say from near Tullytown, Pa.

FRED L. BUTTON. Three species of *Pisidium* from California.

PHILIP P. CALVERT, Ph.D. Seven species of land shells from Giles County, Va.

R. D. CAMP. Five land shells from Texas.

E. P. CHASE. *Helix pisana* Müll. from La Jolla, Cal.

- GEO. H. CLAPP. Eighteen trays of land shells from the Southern States.
- T. D. A. COCKERELL. Land shells from New Mexico and Coronado Island, Lower Cal.
- M. CONNOLLY. Nine trays of land shells from South Africa.
- DELOS E. CULVER. Three shells from New Jersey and Pennsylvania.
- MISS E. CUMMINGS. *Praticolella* from Texas.
- L. E. DANIELS. Forty lots of land shells from Utah.
- J. H. FERRISS. Seventy trays of land shells from Arizona and New Mexico.
- JOHN FORD COLLECTION. Two hundred and fifty-three trays of *Oliva* (purchased).
- H. W. FOWLER. Six species of shells from New Jersey and Virginia.
- FREE MUSEUM OF SCIENCE AND ART. Sixty-three species of Marine shells.
- L. S. FRIERSON. *Ptychobranhus clintonensis* Simps. from Arkansas.
- L. P. GRATACAP. Three species of land shells from Brazil.
- D. K. GREGER. Seven land shells from Oklahoma.
- S. G. GORDON. Four species of land shells from Montgomery County, Pa.
- SEITARO GOTO. Two trays of *Blanfordia* from Japan.
- MORGAN HEBARD. Eleven trays of shells from Florida.
- CHARLES HEDLEY. Six species of shells from Macquarie Island.
- J. B. HENDERSON, JR. Fourteen trays of shells from Cuba, Bahamas and Virginia.
- JUNIUS HENDERSON. Twenty-two trays of land and fresh-water shells from Utah and Colorado.
- H. W. HENSHAW. *Amastra flavescens* Nc. from Olaa, Hawaiian Islands.
- A. B. HOWELL. *Micrarionta intercesa* Binn. from San Clemente Island, Cal.
- C. W. JOHNSON. Ten trays of *Oliva* from Japan.
- F. W. KELSEY. Nine species of shells from California.
- BAYARD LONG. One hundred and forty-nine trays of shells from Ontario, New Jersey and Pennsylvania.
- A. L. LOVETT. Four slugs from Oregon.
- H. N. LOWE. Fifteen trays of shells from California and Mexico.
- C. J. MAYNARD. Thirty-nine species of *Cerion* from the Bahama Islands, (purchased).
- W. G. MAZŮCK. Four species of *Nassa*.
- JOHN H. MCFADDEN. Thirty-nine species of shells from South Victoria Land and New Zealand; Sir Ernest Shackleton's Collection.
- G. W. H. MEYER. Five marine shells.
- H. E. MEYER, M.D. Three marine shells.
- DAVID MILNE. Four marine shells.
- CLARENCE B. MOORE. Seventeen trays of land shells from Alabama and Tennessee.
- MUSEUM OF COMPARATIVE ZOOLOGY. Nine species of land shells from Little Swan Island.
- MRS. IDA S. OLDROYD. Three land shells from California.
- A. OLSSON. *Polygyra thyroidus* Say from near Chestnut, La.
- C. R. ORCUTT. Thirty-three trays of shells from Mexico, Texas and California (purchased).
- W. H. OVER. Seven trays of shells from South Dakota.
- MISS R. M. PIERCE. Four species of marine shells from Wildwood, N. J.

H. A. PILSBRY, D.Sc. Five hundred and ten trays of shells chiefly from the Hawaiian Islands.

EARL L. POOLE. *Helicina amana* Pfr. from Quirigua, Guatemala.

H. W. PRETZ. *Lymnaea obrussa* Say near Corning, Pa.

C. T. RAMSDEN. Three Cuban land shells.

MRS. F. W. RAWLE. One marine shell from Maine.

S. N. RHOADS. Six species of land shells from New Jersey.

S. RAYMOND ROBERTS. Nineteen species of shells from Australia and West Indies.

S. L. SCHUMO. *Vitrea hammonis* Ström from Glenwood Springs, Colo.

B. SHIMEK. *Pisidium virginicum* Gmel. from near Iowa City, Ia.

LLOYD B. SMITH. Twenty-seven trays of shells from Columbia.

G. C. SLENCE. Twelve trays of shells from England.

V. STERKI. Two species of *Pisidium* from South Dakota and Ohio.

WITMER STONE, Ph.D. Four species of land shells from California.

D. THAANUM. Thirteen trays of land shells from the Hawaiian Islands.

L. E. THURSTON. *Achatinella valida kahukuensis* P. & C. from Kahuku, Oahu.

UNIVERSITY OF WISCONSIN. Six Hawaiian land shells.

BRYANT WALKER. Six trays of shells.

J. B. WALTERS AND B. LONG. Fourteen trays of shells from Red Bank, N. J.

HUGH WATSON. *Apera sexangula* Wats. from Grahamstown, South Africa.

S. G. WEIR. Nineteen trays of shells from Alabama and Tennessee.

C. S. WILLIAMSON. *Planorbis parvus* Say from Repaupo, N. J.

MISS H. WINCHESTER. Six marine shells from Wildwood, N. J.

INSECTS.

AMERICAN MUSEUM OF NATURAL HISTORY. Eleven *Conocephalus*, Cuba.

NATHAN BANKS. Three Diptera, United States. Twenty-three Neuroptera, United States.

C. T. BETHUNE-BAKER. Forty Lepidoptera, New Guinea.

HENRY BIRD. Thirty-nine Lepidoptera, United States.

W. S. BLATCHLEY. Seventy-four Coleoptera, United States (purchased).

BROOKLYN MUSEUM. *Melanoplus fasciatus*, Newfoundland.

MALCOLM BURR. Fourteen *Conocephalus*, Southeastern Brazil.

CALIFORNIA STATE INSECTARY. Four *Gammarotettix cyclocercus*, California (paratypes).

P. P. CALVERT, Ph.D. One beetle, New Jersey.

D. M. CASTLE. Five Coleoptera, Florida.

L. CHOPARD. Seven Phasmids, Tropical America (exchange).

B. P. CLARKE. Fifty-eight Lepidoptera, California; nine *Sphingidæ*; twenty *Argynnis*, Canada.

T. D. A. COCKERELL. *Phenacaspis diphonodontis* and *Phenacaspis mischocarpi*, Philippine Islands (Types); twenty-three Orthoptera, various localities.

COLORADO AGRICULTURAL COLLEGE. *Nemobius brevicaudus* (topotypes).

CORNELL UNIVERSITY. Seventeen Orthoptera, Georgia; one hundred and forty-eight Hemiptera, United States.

W. T. DAVIS. One hundred and twenty-one *Ceuthophilus*, Southern States; two Orthoptera, Georgia; one *Cicada davisi*; one *Cressonia juglandis*, North Carolina.

HENRY FOX. Two *Homorocoryphus malivolans*, Virginia; ten insects, New Jersey.

C. W. FROST. Three insects, Philadelphia; three insects, New Jersey.

GEORGIA STATE COLLECTION. Four *Ceuthophilus*, Georgia; fifty *Gryllidæ*, Georgia.

HEBARD-ACADEMY EXPEDITION, 1915. Six thousand five hundred Orthoptera.

MORGAN HEBARD. Ninety-two *Ceuthophilus*, United States; one hundred and thirty-five Orthoptera, Florida, Georgia, Virginia, Rhode Island; fifteen *Gryllidæ*; seven *Conocephalus*, Jamaica, Cuba; six Lepidoptera, Florida; three *Phasmids*, Tropical America; eighteen Orthoptera, United States; eighteen Orthoptera, Pennsylvania, New Jersey.

PHILIP LAURENT. One *Ceuthophilus*, Pennsylvania; nine *Tremex columba*, Pennsylvania; four *Ecpantheria scribonia*, Pennsylvania.

J. W. GREEN. One beetle, Texas.

C. W. JOHNSON. Seventeen Diptera, United States; Bermuda.

BAYARD LONG. One Orthopteron, Pennsylvania; one Coleopteron, New Jersey.

A. H. MANEE. Three Coleoptera, North Carolina.

L. W. MENGEL. *Papilio ascanius*, Brazil.

A. P. MORSE. Three *Gryllidæ*.

MUSEUM COMPARATIVE ZOOLOGY. Six Orthoptera.

H. A. PILSBRY. Fourteen Coleoptera, Virginia; one hundred and fifty insects, New Mexico.

PURCHASED. Two hundred and seventy-eight Orthoptera, Colombia.

C. T. RAMSDEN. Twenty-nine Lepidoptera, Cuba.

J. A. G. REHN. Three Orthoptera, New Jersey; five Orthoptera, Columbia.

JOSEPH STEIGER. Five hundred and forty-six insects, Europe and America.

WITMER STONE. Five Orthoptera, New Jersey; seven Lepidoptera, California.

UNITED STATES NATIONAL MUSEUM. Three *Phasmids*, Tropical America.

H. B. WEISS. Two *Gryllotalpa gryllotalpa*, New Jersey.

L. H. WELD. *Callirhytis furnessæ* and *Synergus furnessana*, Mexico. (paratypes).

H. W. WENZEL. One Euphoria, Texas.

E. GRACE WHITE. Two *Ceuthophilus*, Massachusetts.

R. C. WILLIAMS. Two moths, Guatemala; four *Colias barbara*, California; seven Lepidoptera, Alaska.

INVERTEBRATES.

(Other than Insects and Mollusks).

CHAS. A. CRAMER. *Eropora palmata* Lam. from Manahawkin, New Jersey.

WM. FINDLAY. *Porites asteroides* Lam.

EDWARD N. FOX. *Lepas* from Sea Isle City, New Jersey.

FREE MUSEUM OF SCIENCE AND ART. Four species of invertebrates.

H. W. FOWLER. Several vials of spiders, Bucks County, Pa.

MORGAN HEBARD. Two barnacles from Florida.

F. J. KEELEY. *Paryphacrocea* from Hawks Park, Fla.

BAYARD LONG. Two ascidians and star-fish from Spray Beach, N. J.; one spider, Pennsylvania.

JOHN H. MCFADDEN. Twenty-eight species of invertebrates from South Victoria Land and New Zealand; Sir Ernest Shackleton's Collection.

CLARENCE B. MOORE. *Balanus* from Mobile Bay, Alabama.

C. R. ORCUTT. Two species of Crustacea (purchased).

MISS R. M. PIERCE. *Balanus eburneus* Gld. from Wildwood, N. J.

H. A. PILSBRY. Sixteen species of invertebrates from Arizona and Hawaiian Islands.

C. T. RAMSDEN. Small collection of crabs, Guantanamo, Cuba.

S. N. RHOADS. Two crabs from Panama.

S. RAYMOND ROBERTS. Nine species of invertebrates from Massachusetts and West Indies.

UNITED STATES FISH COMMISSION. Anemone from off Cape Cod, Mass.

GEOLOGY.

JOHN H. MCFADDEN. Series of Antarctic geological specimens; Sir Ernest Shackleton's Collection.

VERTEBRATE FOSSILS.

BAYARD LONG. Three fossil fish teeth.

UNIVERSITY OF CALIFORNIA. Mandible of *Smilodon* sp., Pleistocene of Rancho La Brea, Cal.

FRANK D. BUTLER. (On deposit) two tusks of Mammoth, Alaska.

INVERTEBRATE FOSSILS.

JOHN FORD COLLECTION. Two species of fossil *Oliva* from North Carolina and Florida (purchased).

ROBERT W. HENDY. *Lirona pica* L. from the Post-Pliocene at Horse Hill, Barbados.

MRS. M. K. LANGSDORF. One hundred and sixty-five trays of Devonian fossils from Canandaigua, N. Y.

BAYARD LONG. Fifteen trays of Cretaceous fossils from Blackwood and Vincentown, N. J.

ALBERT MOORE. *Belemnites americana* Morton from the Cretaceous at Barnesboro, N. J.

CLARENCE B. MOORE. *Athyris tumida* Dahm. from the Upper Silurian at Dixie Landing, Tenn.

NEW YORK STATE MUSEUM. *Hydnoceras bathense* H. & C. from Bath, N. Y.

PLANTS.

A. ALLANN. *Muscari comosa*.

E. B. BARTRAM. Twenty-two sheets of local plants.

E. B. BARTRAM and BAYARD LONG. Two hundred and fifty sheets from Eastern Quebec.

WM. G. BASSETT. *Hypopitis*, sp.

O. H. BROWN. Seventy-five sheets of New Jersey plants.

JOSEPH CRAWFORD. Four sheets of local plants.

DR. J. W. ECKFELDT. *Quercus rudkini*.

M. L. FERNALD and BAYARD LONG. Six hundred and fifteen sheets of plants from Block Island and Massachusetts.

WM. FINDLEY. Seven sheets of local plants.

H. L. FISHER. *Malus parviflora*.

DR. C. D. FRETZ. Eighteen sheets of local plants.

E. K. GALE. *Juncus gerardi*.

J. H. GROVE. Seventy-nine sheets of New Jersey plants.

DANIEL W. HAMM. Thirty-three Pennsylvania plants.

LEWIS S. HOPKINS. *Lepidium perfoliatum* and *Isoetes braunii*.

BAYARD LONG. Two hundred and twenty-eight sheets of local plants.

K. K. MACKENZIE. *Gnaphalium helleri*.

J. H. MUMBAUER. *Phegopteris dryopteris*.

FRANCIS W. PENNELL. Three hundred and thirty-two sheets of local plants.

HOWARD W. PRETZ. Nine hundred and sixty-eight sheets of plants from Lehigh County, Pa.

MRS. JOSEPH RHOADS. Herbarium of James and Joseph R. Rhoads of Haddington, Philadelphia, made in 1858 to 1865.

HAROLD ST. JOHN. *Carex platyphylla*.

WITMER STONE. Twenty-five sheets of plants from Minnesota and *Senecio crawfordi* New Jersey.

UNIVERSITY OF PENNSYLVANIA. Sixty-five sheets of *Gerardia*, etc., collected by F. W. Pennell. Two hundred and sixty-nine specimens of local plants in exchange.

J. B. WALTER. *Hex* and *Viola*.

ROBERT WELSH. *Hydrastis canadensis*.

ALMA WILSON. Three sheets of local plants.

ARCHAEOLOGY AND ETHNOLOGY.

GEORGE APPERLEY. Two flint instruments from Wheeler, Indiana.

DR. EDWIN ATLEE BARBER. Section of vegetable fibre rabbit net and section of feather rope, found in earthen jar buried in ancient cliff dwelling in Utah.

WM. L. FANSHAW. Three stone implements from Plymouth Meeting, Pa.

MRS. J. F. HOLT. Eleven ethnological specimens from Greenland.

J. H. McFADDEN. Collection of Sir E. Shackleton's Antarctic photographs.

CLARENCE B. MOORE. Numerous specimens from the Indian mounds of the Southern States added to the Clarence B. Moore Collection.

MRS. WINNIE HOWARD PHILLIPS. A section of tapa cloth made by natives of Pitcairn Island. A section of imitation tortoise shell, made fifty years ago by natives of Banjongie, Java.

PURCHASED. Nine ethnological specimens from Libreville, West Africa; fire-making set and adze from Paragua Island, Philippines; flute, war-club, comb, tapa cloth and grass dress from New Guinea; war-club from Ugi, Solomon Island; four strings of native money, South Sea Islands.

MINERALS, ETC.

Purchased for the Wm. S. Vaux Collection, thirteen specimens.

SAMUEL G. GORDON. Magnetite and Shalerite, Pennsylvania.



3 2044 093 291 235

